

WATER 2015

POLICY PRINCIPLES AND STRATEGIC
GUIDELINES FOR INTEGRATED WATER
RESOURCE MANAGEMENT – IWRM



Published by the Swiss Agency for Development and
Cooperation (SDC) – © 2005

Editorial work

François Münger and Franz Stössel in collaboration
with staff from Head Quarter and Cooperation Offices (SDC);
Sabine Brueschweiler, Andreas Kläy (CDE);
Julian Jones (Skat Consulting)
Christoph Morger (Intercooperation);
Patrick Robinson

Production and Layout

Satzart AG

This publication is available under:
http://www.deza.ch/ressources/deza_product_en_1750.pdf

Swiss Agency for Development and Cooperation (SDC),
Freiburgstrasse 130, CH-3003 Bern, Switzerland
info@deza.admin.ch, www.sdc.admin.ch

WATER FOR THE WORLD	5
CHAPTER 1: INTRODUCTION	6
2.1 Global Challenges	7
2.2 New Developments	7
CHAPTER 2: GLOBAL CHALLENGES IN THE WATER SECTOR	7
CHAPTER 3: VISION	8
4.1 Objectives	9
4.2 Integrated Water Resources Management (IWRM)	9
4.3 Four Categories of Water Use	9
CHAPTER 4: OBJECTIVES AND FOCUS	9
4.4 Basic Values and Interdependent Strategic Fields	10
4.5 Intervention Levels and Priorities	10
CHAPTER 5: CATEGORIES OF WATER USE	11
5.1 “Water for People” – Drinking Water Supply and Sanitation Services	11
5.2 “Water for Food” – Rainfed Farming and Irrigation for Food, Feed and Fibre Plants	11
5.3 “Water for Nature” – Viability and Biodiversity of Ecosystems	12
5.4 “Water for Other Uses” – Industry, Energy and Transportation	12
CHAPTER 6: INTERDEPENDENT STRATEGIC FIELDS	14
6.1 Social	14
6.2 Environmental	14
6.3 Economic	14
6.4 Institutional	15
6.5 Technological	15
6.6 Knowledge	16
CHAPTER 7: IMPLEMENTATION IN SDC	17
7.1 Rationale	17
7.2 Resources of SDC	17
7.2.1 Finances	17
7.2.2 Knowledge and Experience	17
7.2.3 Implementation Tools	17
7.2.4 Organisation within SDC	18
7.2.5 Monitoring and Controlling	18
ACRONYMS	19
GLOSSARY	20
Expressions in <i>italic</i> in the text are explained in the Glossary	
ANNEX 1	34
Significance of the Water Sector in Attaining the Millennium Development Goals	34
ANNEX 2	38
30 Years of SDC Experiences in the Water Sector	38



WATER FOR THE WORLD

Our water is getting scarcer. Population growth and rising per capita consumption put increasing pressure on the availability and quality of *water resources* and on the ecosystems which are key to supply, regulation and purification of water. If current consumption and pollution patterns continue, two out of three people in the world will suffer from water shortages by 2025. However, the world's total *freshwater* reserves are sufficient to meet all our needs if we manage them in better ways; this poses one of the great challenges for mankind in the 21st century.

One third of humanity is already denied access to safe, clean drinking water – even though such access is a basic precondition for healthy living conditions. In addition, a large proportion of people living in developing countries desperately need reliable access to water for irrigation just to meet their basic food requirements. Furthermore, water is an essential input for many industrial processes; its availability is thus a major determinant of economic development.

The satisfaction of our human needs is often obtained at the expenses of the natural environment, which in turn threatens the very basis of our existence. As water scarcity worsens, competing uses of the resource and conflicts of interest over access have to be addressed. The basic question is how to effectively balance water for people, for food, for nature and for industrial and productive uses and at the same time achieve social equity, economic efficiency and environmental sustainability.

In the year 2000, 250 people died every hour worldwide from diseases attributable to dirty drinking water and a lack of adequate sanitation, of which

90 percent children under the age of five (UN World Water Development Report 2003). We all share a moral obligation to make sure that this shameful reality is changed for the better.

Water plays a key role in development cooperation. For 30 years, SDC has supported partner countries in the implementation of their drinking water supply and sanitation as well as watershed management programmes. Water is fundamental for the realisation of the Millennium Development Goals, and SDC plays a key role both in its own right and in partnership with other federal institutions, research organisations, civil society and NGOs active in international development. SDC also advocates a high profile for water on the international political agenda.

This document draws upon SDC's long experience of working in the water sector. It presents the position of SDC facing the global water challenges – both in terms of long term development cooperation and of emergency humanitarian aid – and it charts options for action for Switzerland's cooperation in the coming years in response to those challenges.

In the framework of the *integrated water resource management* concept, the access to services for the poor is the entry point for the Swiss engagement. Water for people and sanitation and water for food are major priorities for SDC investments.



SDC IWRM Team

CHAPTER 1: INTRODUCTION

The Millennium Development Goals (MDGs), enshrined in the Millennium Declaration, call for the global community to “reduce by half the proportion of people who suffer from hunger” (MDG 1) and to “reduce by half the proportion of people without sustainable access to *safe drinking water* and to sanitation services by 2015” (MDG 7). For the realisation of most of the other goals in the Millennium Declaration, the provision of safe and sustainable access to water is also a prerequisite – both for drinking purposes and as a productive asset (see Annex 1).

What are the chances of combating global hunger if the water needed for *irrigation* becomes scarcer and access to *water resources* becomes even more unequal. How can levels of public health improve if wastewater is increasingly allowed to contaminate lakes, rivers and ground water reserves? How can children attend school if they have to spend hours each day assisting their mothers to fetch water for the household? Without progress in the water sector, sustainable *poverty* reduction will not be possible. SDC is committed to play its part in finding solutions to these challenges.

Water is a resource with multiple and competing uses. The levels of access to water, and the quality of that water, have an impact on health, hygiene, nutrition and productivity, and therefore a holistic view of the water sector is imperative. Securing access to water depends on the balance of power between competing user interests – with the poorest segments of society usually having least power and therefore least access. As overall water *scarcity* increases, access to water and a more equitable allocation of existing *water resources* is a sine qua non if a sustainable reduction in *poverty* is to be achieved. All segments of society have to be involved in processes of water policy formulation and decision-making regarding water use and allocation; in addition to improving equitable access, these inclusive approaches have the potential to improve the overall sustainable management of the resource.

This „Orientation Paper“ is a working tool and outlines how SDC aims to contribute in the water sector towards the achievement of the MDGs in the period leading up to 2015. It defines the framework within which 30 years of practical experiences in the water sector will be applied in the years to come, and it sets guidelines for the debates surrounding multilateral policy. The paper provides pointers towards setting up and upgrading competencies to give appropriate advice and support in the challenging period ahead.

SDC promotes a comprehensive view of water issues that takes into account the entire *water cycle* through the use of the internationally accepted concept of *Integrated Water Resources Management* (IWRM). In this way, the document makes an important contribution towards ensuring the coherence of SDC engagements, dealing with *freshwater* as a single, integrated entity.

The document can be viewed at two levels: firstly, it is a fundamental document describing bilateral operational and multilateral priorities across the water sector (policy principles); secondly, it is a guidance document laying out directives for the “Thematic and Technical Resources Department” (strategic directives).

For SDC practitioners and staff dealing with water in bilateral operations and multilateral processes, the working tool provides a guiding framework to be followed in the preparation of policy statements, *PPPs*, credit and project proposals. It may also guide SDC practitioners in their support to sectoral authorities for the development of regional or national water strategies. Suitable adaptation to local context and the needs of our partners is essential.

This document is summarised in “Water 2015 – Principles and Guidelines”, approved by the Board of Directors of SDC on March 16, 2005.

CHAPTER 2: GLOBAL CHALLENGES IN THE WATER SECTOR

Water forms the basis of all life and has a multitude of functions. Water is a habitat and a source of essential sustenance. It enables transportation and food and energy production, thereby facilitating a wide range of economic activities. It is both a *common good* and a tradable commodity and it is deeply embedded in religious and cultural values. Population growth and increasing, uncoordinated demands for water from domestic, industrial and agricultural users, compounded by endemic failures of management and the lack of appropriate legal and regulatory frameworks are reasons for the growing scarcity of this vital resource.

2.1 Global Challenges

At the start of the 21st century, the world faces a number of major challenges related to access and use of water. The World Water Development Report (UNESCO World Water Assessment Program 2003) points out the following:

- 1.1 billion people currently have no access to improved water supply and approximately 2.4 billion people lack access to basic sanitation.
- More than 2.2 million people – mostly children – die from water related diseases every year.
- All over the world, women work longer and harder than necessary because of poor access to *drinking water*.
- 777 million people across the world do not have access to sufficient and adequate food
- Globally, about 70 percent of total *freshwater* withdrawals are for agriculture and *irrigation*; much of this is inefficiently used and poorly managed.
- Fertilisers, agrochemicals and industrial *wastewater* – of which 70 percent in developing countries are dumped untreated – are a major source of water contamination.
- In the course of the 20th century alone, half of all the world's *wetlands* have disappeared and half of all the world's *freshwater resources* have been seriously polluted.
- The economic and human costs of natural water-related disasters (floods, storms and droughts) have been growing steadily in recent years. Global climatic changes will aggravate the situation further.

2.2 New Developments

A number of significant trends in the water sector could be observed in recent years:

Governance

- Many countries are engaged in a process of decentralizing political and economic decision ma-

king to sub national levels – this is a great but challenging opportunity for realizing necessary institutional reforms, democratisation, transparency and participation in the water sector.

- Governments and the public sector are increasingly focusing on their responsibilities as wardens and regulators of the resource and as the facilitators of favourable sector conditions.
- The importance of governments as the operators of water infrastructure appears in some cases to be diminishing but their position as owners of the resource remains essential.
- Globalisation is influencing the water sector and transnational companies have realised some local success stories in water supply and sanitation services. High hopes have been placed on private sector participation but some projects are facing considerable technical, social, economic and political challenges or failed entirely. Good governance at all levels is key to take full advantage of the potential of private sector participation.
- In addition to the development of the local market, regional and international demands have an increasing impact on the quality and quantity of local *water resources*.

Global Changes

- The balance of rural and urban populations is shifting; today nearly 50 percent of the world's population lives in urban areas. The urban population has tripled during the last 50 years and will most likely increase by another 25 percent within the next 25 years (UN Development Division).
- Increased world population, water consumption, water pollution, climate change, inefficient management and wastage result in increased pressure on finite *freshwater resources*.
- Climatic change will alter regional precipitation patterns, increasing the incidence of droughts and floods.
- Competition for scarce *water resources* creates an increased risk for *water related conflicts*, not only at local, but also at regional and international levels.

Water Sector Developments

- The *wastewater crisis* has deepened; the global shortfall in effective *wastewater treatment plants* is a long way from being resolved.
- Agricultural industrialisation has continued, accompanied by a disproportionate increase in water use. Many *large-scale irrigation* schemes have been developed, but their operation remains problematic.
- There is a recent revival in the use of indigenous technologies like rainwater harvesting and *micro-irrigation*.

CHAPTER 3: VISION

The following statements describe SDC's vision for the future of the water sector:

Satisfaction of Basic Needs

All people are able to satisfy their *basic needs* for safe *drinking water*.

Water is available in sufficient quantity and quality for the production of basic food as well as for other economic activities.

Diseases due to contaminated water or lack of water, or lack of access to sanitation or poor hygienic conditions, are eliminated.

The long term sustainability of infrastructure and service provision is assured.

Water Cycle

Water is used sparingly and with moderation. Water extraction does not jeopardise the viable functioning of ecosystems, and interference in the natural *water cycle* occurs in a way that ensures the preservation and continuous regeneration of *water resources*.

Natural Hazards and Risks

The negative consequences of climatic changes and the risks associated with water-related natural disasters (droughts, floods and storms) are significantly reduced through long-term planning and action. Contingency plans and appropriate structures are put in place. The effects of damage that occurs in spite of these measures are alleviated through solidarity and concerted action.

Participation

Every human being assumes the responsibility for the protection and the judicious use and management of *water resources* and their related ecosystems. Women and men participate on an equal basis.

Cultural values and traditional, local knowledge are acknowledged and adequately taken into account as important contributions towards *sustainable water use*.

All social groups are empowered to exercise their rights without discrimination.

Governance

The public and private sectors, together with civil society, apply a policy of *sustainable development* and management of *water resources*. A clear and transparent legal frame regulates and guarantees access and use of water for all. Legal mechanisms exist to protect the rights of local populations.

Institutions and processes of interaction are geared towards transparency, accountability, equity and efficiency. Planning and decision-making are deferred to the lowest possible level (*subsidiarity principle*). The disparate interests of all *stakeholders* – especially those of the poor and marginalized segments of society – are duly considered. This is recognised as being crucial for long term sustainability, social and political stability and conflict prevention.

CHAPTER 4: OBJECTIVES AND FOCUS

4.1 Objectives

SDC puts people at the centre of development and focuses on poverty reduction. SDC’s approach in the water sector has the following three main thrusts that will contribute to the achievement of the MDGs:

1. equitable access to water and basic water services for all without discrimination
2. efficient use of water and water infrastructure
3. sustainable management of the water resource.

4.2 Integrated Water Resources Management (IWRM)

Water is essential for life and key for social, cultural – religious, economic and environmental development which determine its value. The integrated management of *water resources* takes place in a specific spatial context – the *watershed* – and the *watershed/catchment* is considered the most logical unit for planning and management.

SDC takes a holistic view of the *water cycle* for its water-related interventions and promotes the internationally accepted concept of *Integrated Water Resources Management (IWRM)*. Measures to cope with droughts and/or floods are an integral part of all water development programmes.

According to the Global Water Partnership (GWP):

“IWRM is a process that promotes the coordinated development and management of water, land and related resources in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. Integrated management has to be applied through a complete rethinking of water management institutions – putting people at the centre”.

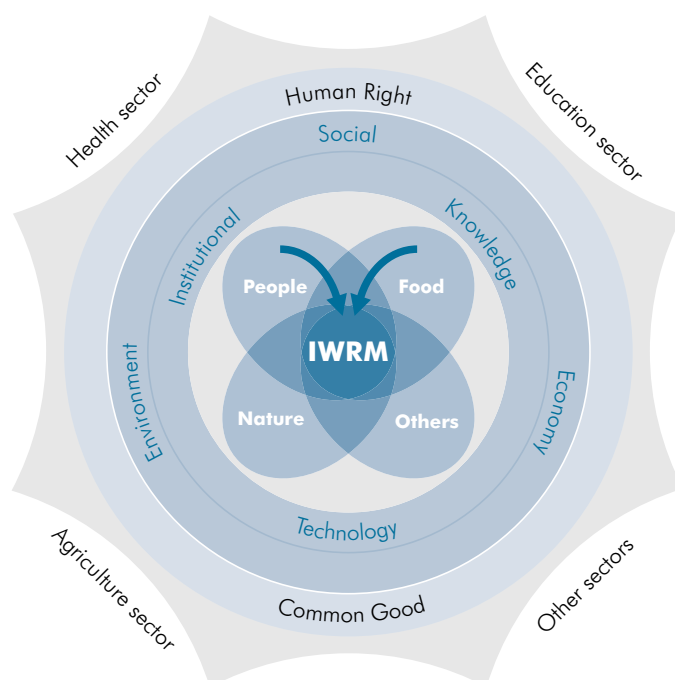
Integrated water resource management is therefore a systematic process for the sustainable development, allocation and monitoring of water resource use in the context of social, economic and environmental objectives.

4.3 Four Categories of Water Use

The Global Water Partnership identifies four categories of water use (see Figure 1):

- **Water for People** refers to the *drinking water* sector and to sanitation services.
- **Water for Food** refers to the *farming* sector including livestock and fisheries and rainfed or irrigated cultivation of food, feed or fibre crops.
- **Water for Nature** refers to the source of water as well as to the availability of water for nature and for the preservation of ecosystems.
- **Water for Other Uses** refers mainly to the use of water for industry, energy and transportation.

Figure 1: The Integrated Water Resources Management Framework



SDC prioritises “Water for People” and “Water for Food” as entry points for its interventions. Water as a common good and water as a human right are basic values (○). Interventions are guided by six interdependent strategic fields (●)

4.4 Basic Values and Interdependent Strategic Fields

Water as a *human right* and water as a *common good* are recognized as two *basic values*.

Water as a Human Right: SDC supports a rights based approach: (i) making authorities responsible for respecting, protecting and fulfilling the access right to sufficient, safe and affordable water for all people; (ii) empowering people to exercise their rights and responsibilities.

Water as a Common Good: Water is vital to life, thus it is considered as a *common good*. But water is also a limited resource with competing uses; it therefore has an economic value. Public oversight and management of water must take this into account.

SDC's programmes are guided by six interdependent fields in order to ensure equitable, efficient and *sustainable* management of the *water resources*. In a balanced development approach these six fields are prerequisites for optimum planning and effective programme implementation.

The six interdependent strategic fields are:

The three pillars of sustainability:

- Social
- Environmental
- Economic

And the three thematic fields:

- Institutional
- Technological
- Knowledge

4.5 Intervention Levels and Priorities

SDC engages with its partners at three complementary intervention levels:

Micro Level: SDC supports development through projects that have a high potential to influence national and regional strategies and to be taken to scale in national programmes. In emergency situations, project support for rural and urban areas may be given even in cases where the potential for scaling-up is absent.

Meso Level: In order to improve the efficiency of national *stakeholders* and international development organisations, SDC contributes to the development of competencies (capacity building) and to coordination between organisations. Institutional capacity building is mainly focused on human resource development, management and training.

Macro Level: Based on the practical experiences acquired at micro and meso levels, SDC participates in policy dialogue at bilateral and multilateral level. In order to increase its impact and advocate for the interests of the poorer sections of society, SDC is active within political alliances and relevant networks with the aim to influence financially stronger players.

SDC supports Water for People and Water for Food as principal entry points for operational and development-related engagements. In the frame of IWRM, links with the categories Water for Nature and Water for Other Uses are considered. In emergency situations, SDC's humanitarian aid prioritises the provision of safe *drinking water* and basic sanitation in the short term, and the mitigation of natural water-related disasters in the longer term.

CHAPTER 5: CATEGORIES OF WATER USE

5.1 “Water for People” – Drinking Water Supply and Sanitation Services

Challenges

Poor maintenance and weak management of distribution systems lead to high levels of wastage. The consequences are increased water shortages and reduced and inequitable access to *drinking water* – in turn leading to public health problems and conflicts.

To reach the MDG target for *drinking water* and sanitation by 2015, access to *drinking water* is needed for an additional 250 000 people daily and to basic sanitation services for approximately 300 000 people more per day.

Objectives

The availability of *drinking water* for all people at all times in sufficient quantity and quality, as well as sanitation, hygiene and adequate solid waste management are the first objective of water interventions.

Policy Principles

- People have a right to access to *drinking water* and need adequate sanitation and hygiene.
- The provision of water for drinking purposes has priority over all other uses.
- Water supply and sanitation are fundamental to national health and development policies and Poverty Reduction Strategy Papers (PRSP).
- In emergency situations and disasters, supply of *drinking water* and sanitation are of highest priority.
- To improve welfare in a *sustainable* way, investments in water supply and sanitation should be linked to income generation (for instance horticulture, livestock keeping).
- The cultural and social context is of paramount importance in the design of sanitation and hygiene interventions.
- Water has a price but tariffs must be designed to guarantee access to *drinking water* for all.

Programme Priorities

- SDC programmes comprise water supply, sanitation, hygiene, *wastewater* and solid waste management and recycling.
- Sanitation programmes are attributed a higher priority because urgent action is needed in this field particularly in urban areas.
- SDC supports the HCES approach (*Household Centred Environmental Sanitation*) as well as ecological approaches to sanitation.

- In addition to a long-standing focus on rural *drinking water* supply issues, SDC increasingly supports the improvement of *drinking water* supply and sanitation services in small towns and peri-urban areas. SDC is not in a position to fund comprehensive water supply and sanitation programmes in urban areas. However, it may directly fund pilot projects where substantial benefits concerning water management in cities can be expected.
- SDC supports public health and information campaigns.
- SDC will support the development of an enabling environment for *private sector participation* through multi-stakeholder dialogues and will advocate for an adequate system of rules and regulations, particularly where this enhances the role and potential of small-scale providers.
- SDC interventions in this category, which have a fundamental impact on water related diseases (e.g. diarrhoea) seek to create synergies with actors working on *major environmental diseases* at the household level to increase the overall health impact.

5.2 “Water for Food” – Rainfed Farming and Irrigation for Food, Feed and Fibre Plants

Challenges

About 70 percent of all *freshwater* withdrawals are used for *irrigation*. Inefficient *irrigation* techniques and management combined with high water losses through evaporation, groundwater that is overdrawn or polluted by fertilizers, pesticides, household effluents and hazardous chemicals and water and soil salinisation, all endanger the availability of fresh water and jeopardize food supply and health.

To reach the MDG 1, an increase in water for food production is necessary. FAO estimates that in 2025 about 300 km³ more will be required as compared to the base year 1995.

Objectives

The main objectives of interventions related to water for food are the *sustainable* use and management of natural resources, the improvement of food security and the creation of income generating activities for rural populations.

Policy Principles

- Focus on rural areas in semi-arid and arid regions.
- The promotion of soil and water conservation measures and improved *farming* practices.
- The strategy “*more crops and jobs per drop*”, as long as this is planned in an environmentally friendly and socially acceptable way.
- Water as an input for *farming* has a price.

Programme Priorities

- Where *rainfed-farming* is possible, measures aimed at soil and water conservation are supported.
- SDC promotes water harvesting for supplementary *irrigation* in drylands and seasonally dry areas.
- Promotion of appropriate, cost-effective and environmentally friendly technologies and user systems for *irrigation* (drip-irrigation, treadle pumps) as well as soil and water conservation (water efficient crop varieties, slope agriculture technologies, rainwater harvesting).
- SDC concentrates its efforts at the village level, with an important focus on hillside *farming* and *watershed development*.
- SDC does not support new construction of *large-scale irrigation* schemes. Where such schemes already exist, SDC supports improved management and rehabilitation measures.
- SDC considers that the integration of economic incentives (promotion of small business enterprises and of traditional varieties, indigenous species and high value crops where appropriate) is a vital element for strengthening the income-generating component of water projects.

5.3 “Water for Nature” – Viability and Biodiversity of Ecosystems

Challenges

In “Water for Nature” we consider mainly the management of water quantities, to maintain the existence, the functionality and the regeneration capacity of vital ecosystems, specifically those that are dependent on the *water cycle* as a whole. Water-related ecosystems such as lakes, rivers, wetlands, forests and soils play an essential role in capturing, cleaning, storing and distributing water.

The excessive use of natural resources and the deterioration of the *wetland* habitats threatens water availability for human consumption, sanitation, food production and endangers local fisheries – an important source of food and income especially for

poorer sections of society. Yet tourism – especially ecotourism – could generate significant opportunities for local employment and income if *water resources* were managed appropriately and water used judiciously.

Objectives

Across all *water use categories*, SDC promotes water saving and conservation in order to preserve the functionality and the regeneration capacity of ecosystems upstream and downstream. The objective is to safeguard *freshwater* supplies that are needed for human consumption, for food production, for nature and for other uses. Water use must remain in balance with the available resources and ecosystems, and surface and groundwater reserves must be protected from excessive use.

Policy Principles

- Enough *freshwater* has to be preserved for ecosystems to maintain their biodiversity; overexploitation of ground- and surface *water resources* must be avoided.
- SDC supports the *environmental flows concept*: minimum river flow is essential and has to be maintained for sustaining ecosystems and human activities downstream.

Programme Priorities

- To protect *wetlands*, water-related ecosystems and forests and to raise awareness, SDC supports a range of international nature conservation organisations.
- SDC supports permanent ground- and surface water monitoring, mapping and modelling systems.

5.4 “Water for Other Uses” – Industry, Energy and Transportation

Challenges

Modern industrial processes are heavily dependent on water use and they have a strong influence over its downstream quality and quantity. In many of SDC’s partner countries, industry is expanding rapidly and contamination by industrial waste and *wastewater* is increasing. The introduction of improved technologies with more efficient and cleaner production methods and better management systems could have a significant positive impact on both the quantities of *wastewater* produced and the severity of contamination caused by uncontrolled discharge.

Large dams, which affect the natural *water cycle*, can inflict high social and ecological costs in the long-term. Conversely, energy production by hydro-electric power plants is in many situations a relatively cost-effective, environmentally friendly and *sustainable* technology. Furthermore, water storage can play a major role in *irrigation* and in reducing floods and droughts (multipurpose infrastructures).

Objectives

In all *water use categories*, SDC promotes systems of stewardship and accountability that protect people and the environment. SDC therefore promotes systems that lead to the *sustainable* use of water by the industrial sector.

Policy Principles

- Bilaterally, SDC is not in a position to finance *large-scale* projects. This specifically includes *large-scale irrigation* schemes and *bulk water transfers* over long distances. However, SDC can support management and rehabilitation of existing schemes as well as policy, feasibility and impact studies.

- In cases where SDC is involved with multilateral projects, SDC insists on appropriate compliance with the guidelines of the World Commission on Dams and defends the interests of the poorest segments of society through advocacy.

Programme Priorities

- SDC promotes and supports measures which aim for cleaner industrial production and supports decentralised and appropriate alternative energy projects.
- SDC supports the multipurpose use of dams.
- SDC supports the WEF water initiative (World Economic Forum) to increase stewardship and responsiveness of the private sector in water management in partnership with the public sector and civil society.

CHAPTER 6: INTERDEPENDENT STRATEGIC FIELDS

6.1 Social

For the promotion of social development, SDC applies a *livelihood approach*, in which individual interventions in the water sector or in other areas are planned within a framework that takes into account health, agriculture, production, education and the environment. The promotion of local initiatives and the development of local solutions are all important in reaching a *balanced development* which is *sustainable* and anchored in the local context.

- Improvements in the water sector are decisive for the empowerment of the poor. People develop ownership for the entire development process if they feel that they have a chance of gaining access and control over water.
- SDC promotes a decentralised, bottom-up approach, in which participation by all segments of the society is essential.
- SDC promotes legal systems that acknowledge indigenous rights and rights of minority groups without discrimination and marginalisation.
- SDC applies the *Demand Responsive Approach* (DRA), where consumers are empowered to make informed choices and where they have control over investment and operational decisions. In the DRA, governments play a facilitating role.
- Women are involved with equal rights as individual users and as partners for institutional development. SDC especially promotes access to water and sanitation in schools which is considered crucial for the attendance of girls.
- SDC advocates the recognition of local and indigenous knowledge in national (water) strategies and recognises this knowledge in the planning and implementation of its own programmes and projects.

6.2 Environmental

Protection of surface and groundwater against sources of pollution from agriculture and industry is essential. *Sustainable* use and management of land is thus important for the protection of *water resources*.

Management of environmental risks comprises the prevention of hazards, where possible, and the mitigation of negative effects. In the event of emergencies, it also includes the organisation of immediate response measures and rehabilitation through concerted action in the longer term.

- SDC recognises existing international environmental agreements and conventions and supports

their implementation in partner countries. These include:

- Framework Convention on Climate Change and the Kyoto Protocol
- Convention to Combat Desertification
- Convention on Biological Diversity
- Ramsar Convention on *Wetlands*.
- SDC encourages the application of the *precautionary principle*, the *polluter pays principle*, and the implementation of compensation schemes for environmental services. SDC also promotes financing of environmental services through the private sector and civil society.
- SDC supports environmental organisations for monitoring (in a “watchdog” function).
- In all activities affecting water and land use, SDC applies the approach of *integrated risk and disaster reduction*. Risk assessments are an important diagnostic tool in priority setting when coping with floods, droughts, storms and other water-related hazards.

6.3 Economic

The costs of water infrastructure and its long-term management and operation have to be paid for by someone. International, national, regional and local finances will need to be mobilised to meet the MDGs. A *sustainable* cost-recovery system is always required, and SDC favours an approach where the consumer covers the costs of operation, maintenance and – at least partially – of replacement. However, initial investments may often need to be subsidised from internal (government) or external sources.

Access for poor people can be assured through the provision of differential tariffs insuring a basic supply at minimal cost (cross- subsidies from other consumer groups), or through direct subsidies (usually from the tax base). Subsidising the initial connection costs to the service is more effective and equitable for improving access than subsidising consumption costs once connected.

- SDC seeks to attract all appropriate sources for financing and promotes the use of modern economic instruments in the water sector.
- SDC supports mechanisms facilitating access to bank credits for the local public, private and civil sectors especially for poor communities.
- SDC advocates mechanisms, like payment for environmental services or risk sharing, to encourage *private sector* investment but SDC is not in a position to share large-volume financial risks with the private sector.

- SDC supports the development and promotion of low-cost and cost-saving technologies. Similarly, it also promotes local businesses that produce such technologies, and the corresponding supply chains that provide products, support and services, thereby contributing towards local income generation.
- SDC explores the potential of solidarity fund-mobilisation by civil societies in the North, e.g. with an additional solidarity cent on the ordinary water rates or on bottled water.
- SDC supports capacity building of local private enterprises for the provision of services and the production of relevant goods for the creation of water infrastructure.
- SDC encourages public-public-partnerships (PUPs) in water supply services.
- SDC works to resolve international cross-border conflicts of interests Through various conflict mediation techniques, SDC works towards solutions that are characterised by equity between the various parties residing in and using watersheds.
- SDC promotes regional organisations and commissions for the joint management of shared water resources between neighbouring states. SDC supports the development of tools (i.e. impact studies) for use by river commissions. It supports the development of appropriate, balanced membership and representation in such organisations. However, long-term assistance to large commissions is not considered effective.

6.4 Institutional

SDC supports institutional development in accordance with *good water governance*, in particular institutions that permit an appropriate and locally adjusted sharing of roles and responsibilities between government authorities, civil society and the private sector. SDC also supports the decentralisation of water management systems. While governments must remain the owners of the resource and carry the ultimate responsibility for all legal and regulatory aspects of water management, they can delegate or transfer the right to use and/or the task of distribution to private operators under transparent and fair conditions. To avoid abuse of monopolistic power it is also strongly recommended that the public sector retains the main ownership of public water supply and sanitation assets.

- SDC supports multi-sector cooperation between the key institutions of MDG relevant sectors, to induce synergies at the international, national and local level.
- SDC seeks to support political processes at all levels that enable government authorities to act as effective regulators.
- SDC advocates capacity building of the public sector in order to enable civil authorities to assume their responsibilities in the water sector (legislation, regulation, monitoring and distribution) and to safeguard the right to access and basic services for all.
- SDC supports *subsidiarity* – the management of resources, including financial resources – at the lowest appropriate level.
- SDC encourages reform processes that promote decentralisation and participation, combat corruption, and clarify the roles of the public sector, the *private sector* and civil society. SDC promotes specific local models of good governance and capitalizes on such experiences.
- SDC supports multi-stakeholder dialogue to take advantage of the potential of *private sector participation* (PSP) in service provision.

6.5 Technological

A major challenge in the water sector is to shift from simply promoting technologies to supporting the use of appropriate technologies and services. This requires the development of suitable and affordable products, which respond to the demands of poor people and for which support is available throughout the design life cycle from acquisition to operation, maintenance and ultimately disposal or replacement. Complex supply chains for product delivery or for operation and maintenance are often not *sustainable* and thus not appropriate. Appropriate products are those that provide a significant return on investment for local business which manufacture them, for local intermediaries and for the ultimate client and user.

- SDC supports socially acceptable, efficient, affordable, cost effective and environmentally friendly technologies.
- SDC focuses on products and technologies with the potential for multiple uses and with a significant impact on *poverty* reduction. Promoting acceptance/appropriation by the population of such products will also be supported. Examples include motorized water supply systems and electrical power generation for lighting, household water supply or *small-scale irrigation*.
- SDC supports technology development by the private sector where such technologies can improve services to the poor. Technology development in partnership between universities of the North and the South, national GOs and/or NGOs are encouraged.

- For sustainability, technological choices must be linked to appropriate support for service provision and to capacity building for operation and management in a given local context.
- SDC also supports market development, in particular social marketing and/or generic marketing.
- SDC encourages its partners to consider a number of criteria when making technical choices:
 - Developments based on improvements to already existing technologies where possible
 - Appropriate level of standardisation of technologies avoiding market monopolies
 - Operation and maintenance requirements appropriate for the target group of users.
- SDC considers the development of competencies as the basis for strengthening institutions and thus actively promotes action oriented research, knowledge transfer and skill development in all areas.
- SDC fosters and supports national and international networks, centres of knowledge and communities of practice as drivers to generate and transfer of knowledge.
- SDC actively seeks cooperation and information exchange with other federal agencies, international institutions and organisations as well as with the private sector and NGOs.
- SDC seeks to increase its capacity and influence by conducting specific professional training courses and by remaining involved in international consultations on water sector issues.

6.6 Knowledge

Knowledge and skills development is the foundation of institutional strengthening both in partner organisations and within SDC. SDC advocates the need for action towards political bodies, the public and private sector and civil society to achieve the MDGs in Switzerland, the partner countries and at international level.

CHAPTER 7: IMPLEMENTATION IN SDC

7.1 Rationale

This section explores how the Policy Principles and Strategic Guidelines will be translated into concrete actions in the field and at the international level. In general, SDC seeks to support and work with key organisations, networks and partnerships which are in a position to use their own local experience to influence national and international dialogue on water issues. SDC seeks cooperation with such organisations both bilaterally (at country level) and through multilateral arrangements (for example through support to the Global Water Partnership, GWP) in order to contribute to the policy dialogue at all levels – national, regional and international. SDC endeavours to bring its influence to bear by active participation in the steering boards of its major partners.

Management and implementation of SDC's water programs and projects is decentralized. The Policy Principles and Strategic Guidelines generic and have to be adapted to the local context and focused on key needs in the sector. At the country level, Cooperation Strategies have to analyse the water sector and its potential for SDC's involvement. Water experts in the Cooperation Offices (COOFs) take the lead in the implementation of this strategy at the operational level. Cooperation with national partners and regional networks is essential for the COOFs. SDC Head Office plays a main role in knowledge generation, advice and advocacy and has the lead in multilateral and international engagements.

SDC participates in international dialogue in close cooperation with other federal authorities, especially with the State Secretariat for Economic Affairs (seco), the Swiss Agency for the Environment, Forests and Landscape (SAFEL), the Swiss Federal Office for Agriculture (FOAG), the Swiss Federal Office for Water and Geology (FOWG) and the Swiss Federal Office of Public Health (SFOPH). SDC participates selectively in relevant conferences, seminars and workshops at the appropriate levels from local to global. Selection criteria for participation are the opportunity to improve the coherence of international development assistance, to influence the global policy dialogue and the relevance for operational activities.

In Switzerland, SDC actively seeks to create coherence and synergies among key stakeholders involved in development assistance associated with water issues.

7.2 Resources of SDC

7.2.1 Finances

Within its overall budget frame, SDC continues to finance bilateral and multilateral water sector projects at least at its current level. SDC's multilateral funds will be opened up for water activities. Additional funds will be made available in emergencies and for disaster relief. SDC also promotes the mobilisation of funds from the private sector and civil society.

The IWRM Team will continue to lobby for maintaining and increasing the current level of funding. These investments will be primarily in the areas of Water for People and Water for Food. Considerable funding also flows to water management sub-components as part of broader development projects focusing on rural development, decentralisation or natural resources management.

7.2.2 Knowledge and Experience

The IWRM team promotes coordination and cooperation between various departments and operational units of SDC and facilitates a truly integrated approach. Learning from experiences is a continuous process and regular internal workshops on IWRM for all SDC staff involved in the water sector serve as a platform for exchange of information and experiences among and between COOFs and Head Office. SDC seeks to safeguard and continuously expand its existing in-house competencies in IWRM.

7.2.3 Implementation Tools

SDC is developing a range of tools for the promotion and implementation of its water strategy within ongoing and planned activities. The existing SDC Sector Policy for Water and Sanitation (1994) will be revised; in the Water for Food sector, adapted implementation tools will be developed in the frame of the country programmes jointly with the local partners.

The following publications are either in preparation or planned:

- Sanitation as a Business: Approaches for Demand-oriented Policies
- SDC Sector Policy on Water Supply and Sanitation 1994 (in revision)
- Policy Principles and Implementation Guidelines for *Public Private Partnership* for Water Supply and Sanitation Services (2005)
- Water and Small-Scale Production (in preparation)
- Water and Culture (in preparation)

- SDC Policy on Water and Food (planned)
- Finance: Mechanisms for Risk Sharing (planned)
- Water and Environmental Health (planned)
- Participatory *Watershed Management* (planned).

7.2.4 Organisation within SDC

The organisational units are responsible for the implementation of the “Water 2015 Principles and Guidelines”. Support is provided by the focal point for water at Head Office, the IWRM Team. The team is under the joint responsibility of the Social Development (SoDev) and Natural Resources and Environment (NRE) divisions and may mobilize support from representatives from all organisational units within SDC.

The IWRM team is in charge of coordination with other federal authorities and coordinates their positions in the dialogue within the frame of the Inter-departmental Sustainable Development Committee (ISDC) for water. Similarly, the IWRM team is responsible for institutional networking and institutional learning and knowledge management on the water and development topic.

The IWRM team is also responsible for advice and support to projects and programmes. All requests for advice and consultations that relate to water projects are channelled through the IWRM team. Requests will subsequently be directed to the appropriate operational units and experts.

7.2.5 Monitoring and Controlling

The continuous progress monitoring with respect to the implementation of the “Water 2015 – Principles and Guidelines” is the responsibility of the organisational units. The IWRM team compiles an annual report on the coherence of the portfolio and on the efficient and effective utilisation of resources in the water sector. If deemed necessary, the “Water 2015 – Policy Principles and Strategic Guidelines for Integrated Water Resource Management – IWRM” will be adapted to changed frame conditions.

Contact

Francois.Muenger@deza.admin.ch
Willi.Graf@deza.admin.ch

ACRONYMS

ADB	Asian Development Bank	PES	Payments for Environmental Services
DRA	Demand Responsive Approach	PPP	Public-Private Partnership
Ecosan	Ecological sanitation	PRSP	Poverty Reduction Strategy Papers
ES	Environmental Sanitation	PSP	Private Sector Participation
FOAG	Swiss Federal Office for Agriculture	PUP	Public-Public Partnership
FOWG	Swiss Federal Office for Water and Geology	PUWR	Potentially Utilizable Water Resources
GWP	Global Water Partnership	PWS	Primary Water Supply
HCES	Household Centred Environmental Sanitation	Ramsar	The Ramsar Convention on Wetlands
INBO	International Network of Basin Organisations	RBO	River Basin Organisation
ISDC Water	Interdepartmental Sustainable Development Committee Water	SAEFL	Swiss Agency for the Environment, Forests and Landscape
IUCN	International Union for the Conservation of Nature and Natural Resources	SDC	Swiss Agency for Development and Cooperation
IWRM	Integrated Water Resources Management	seco	State Secretariat for Economic Affairs
MDGs	Millennium Development Goals	SFOPH	Swiss Federal Office of Public Health
NRE	Natural Resources and Environment Division	SHA	Swiss Humanitarian Aid Unit
OECD	Organisation for Economic Cooperation and Development	SoDev	Social Development Division
		UNESCO	United Nations Educational, Scientific and Cultural Organization
		WCD	World Commission on Dams
		WHO	World Health Organisation
		WSS	Water and Sanitation Service

GLOSSARY

Access to improved drinking water supply and sanitation

An improved water source is any form of water collection or piping used to make water regularly available and reasonably protected from contamination. Quantitatively, WHO and UNESCO define an improved source in rural areas as a source that provides 20 litres per capita per day at a distance no greater than 1000 metres. In urban areas, access to piped water or a public standpipe should be within 200 meters of a dwelling or housing unit.

Whether water quality is satisfactory will depend on its intended use (e.g. for drinking, bathing, irrigation, industrial use).

Urban areas with access to sanitation services are defined as urban populations served by connections to public sewers or household systems such as pit privies, pour-flush latrines, septic tanks, communal toilets, and other such facilities. Rural populations with access are defined as those with adequate disposal such as pit privies, pour-flush latrines, etc. Application of these definitions may vary, and comparisons can therefore be misleading.

Balanced-Development Approach

The Balanced-Development Approach is based on an equal consideration of the social, environmental, economic, institutional and technical costs and benefits of any intervention, and promotes action in the fields of rules, regulations, skills and knowledge.

**Basic Needs/
Basic Services**

The concept of meeting “basic needs” was developed in the 1970s and internationally adopted to supplement economic growth as the primary target of development co-operation. The meeting of basic needs for food, water, shelter, health care and education thus became the driving force of the second and third UN Development Decades (1970s and 1980s).

Basic services refers to the minimum amount of public services that a society would like to provide to everyone. The concept of “basic services” was developed as the strategy for meeting basic needs, initially in health care and water supply; later in sanitation, household food security and education. The concept of basic services therefore also conveys the idea of facilitation via support to community mechanisms (low-cost, appropriate technology approaches; recruitment and training).

Catchment Area

See Watershed

Common Good
See also *Public Good*

In the popular meaning, the common good describes a specific “good” that is shared and beneficial for all (or most) members of a given community. This is also how the common good is broadly defined in philosophy, ethics, and political science. However, in economics, the term “common good” is used to refer to a competitive non-excludable good.

Water should be considered as a composite good combining elements of public and private goods. Water does possess an important characteristic of a public good, i.e. non-excludability – since the consequences of denying access would be culturally and politically unacceptable to much of mankind.

Water ownership and use might be classified as “a good belonging to and managed by a community”. Water should therefore be considered as a “common good” that qualifies for both private and communal ownership and use. This would allow for a wide range of water management systems that can suit various socio-economic, ecological and ethical conditions.

Cost Recovery, sustainable

Sustainable cost recovery relies on a series of factors that range from tariff design to the design of an appropriate strategy, the application of sound financial management principles, the optimisation of costs and the promotion of willingness to pay. According to ADB, goals of cost recovery include good governance, financial sustainability, distributive justice, economic efficiency, and fair pricing. However, sustainability for SDC also necessitates that the ecological objectives of safeguarding the resource base are included in these goals.

Demand Responsive Approach (DRA)

This approach requires that consumers be involved in selecting, financing, implementing and managing water and sanitation services that meet their demands and be willing to pay. Community members make informed choices on: whether to participate in a project; technology and service level options based on willingness to pay; when and how their services are delivered; how funds are managed and accounted for; and how their services are operated and maintained. Government plays a facilitative role, sets clear national policies and strategies, encourages broad stakeholder consultation, and facilitates capacity building and learning. An enabling environment is created for the participation of a wide range of providers of goods, services and technical assistance to communities. An adequate flow of information is provided to the community, and procedures are adopted for facilitating decisions on collective action within the community.

Drainage Basin

See Watershed

Drinking Water, safe

Safe drinking water includes treated surface water and untreated water from protected springs, boreholes, and sanitary wells. WHO's norms for drinking-water quality go back to 1958. An established goal of WHO and its Member States is that: "all people, whatever their stage of development and their social and economic conditions have the right to have access to an adequate supply of safe drinking-water". In this context, "safe" refers to a water supply with a quality that does not represent a significant health risk, is of sufficient quantity to meet all domestic needs, is available continuously, is available to all the population, and is affordable.

Ecosan Approach

Ecological sanitation can be viewed as a three-step process consisting of containment, sanitization and recycling of human excreta. The objective is to protect human health and the environment while reducing the use of water in sanitation systems and to recycle nutrients to help reduce the need for artificial fertilizers in agriculture.

Ecosystem Approach

In relation to water, the ecosystem approach is concerned with conservation, sustainable use and integrated management of ecosystems such as wetlands, forests and soils that capture, filter, store and distribute water. Its specific aims are to: (1) maintain ecosystem functions and services; (2) support livelihoods; (3) ensure equitable sharing of benefits amongst stakeholders; (4) promote adaptive management to enable people to make informed choices; (5) decentralize management, to empower people to manage their own resources; and (6) foster intersectoral cooperation, to achieve greater effectiveness through partnerships.

**Environmental Sanitation/
Ecological Sanitation**

Environmental sanitation (ES) involves interventions to reduce peoples exposure to disease by creating a hygienic environment. This usually includes disposal of or hygienic management of excreta, refuse, wastewater and storm water, the control of disease vectors, and the provision of facilities for personal and domestic hygiene. Ecological sanitation technologies take the principle of environmental sanitation a step further, as it is structured on recycling principles and aims to maintain a closed eco-cycle. It is also a low-energy approach that uses natural processes.

Environmental Diseases

Environmental diseases are diseases caused by environmental risks. According WHO, childrens health is endangered by six groups of risks: household water scarcity, hygiene and sanitation, air pollution, disease vectors, chemical hazards, and unintentional injuries (accidents). Diarrhoea, caused by unsafe water, is the second biggest child-killer in the world. Vector-borne diseases include malaria (with over a million deaths a year, mainly of children under five), lymphatic filariasis, schistosomiasis, dengue fever and others.

Environmental Flows

“Enough water is left in our rivers and lakes, which is managed to ensure downstream environmental, social and economic benefits.” Source: Flow, the essentials of environmental flows, (IUCN 2003).

Farming

The practice of cultivating the land, raising stock, and fishery practices. Farming includes occupations and income-generating activities from cultivation, animal husbandry, arboriculture, fish farming, horticulture and home gardening of vegetables, fruit trees and flowers.

Freshwater

Naturally occurring water having a low concentration of salts, which is often suitable for abstraction and treatment to produce water for domestic, agricultural and industrial uses.

Global Public Good
See also *Common Good*
and *Public Good*

A global public good is a public good with benefits that are strongly universal in terms of countries (covering more than one group of countries), people (accruing to several, preferably all, population groups), and generations (extending to both current and future generations, or at least meeting the needs of current generations without foreclosing development options for future generations).

Good Water Governance

Good governance exists when interrelations and division of roles between the state, civil society and the private sector are based upon participation, transparency, non-discrimination, and the effectiveness and reliability of public affairs. As a basic source of life, water resources must be governed within a framework of shared responsibility, involving an obligation on the part of all people and institutions, both individually and collectively, to value and protect them.

Local authorities must lead the movement for responsible water governance. While water resources are amenable to public, community or private management, they need to be controlled, secured and governed by accountable public authorities, or by recognized indigenous or traditional authorities. In order to promote responsible water governance, governments must support the participation of all stakeholders as partners, with full information, in protecting watershed areas and in determining the water and environmental sanitation services that they receive.

**Household-Centred
Environmental
Sanitation (HCES)**

HCES is an approach to planning environmental sanitation services to overcome the shortcomings of conventional services through two components: the household as a focal point, and a Circular System of Resource Management (CSRSM). The CSRSM emphasizes water conservation, recycling, and reuse, as waste is a misplaced resource and using it reduces downstream pollution.

Human Right

Water as a Human Right

The right to water is implied in Article 25 of the Universal Declaration of Human Rights: “Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family”. The right to water entitles every human being to sufficient, safe, accessible and affordable water. This right must be enjoyed equally and without discrimination by women and men. Human rights chiefly concern the relationship between the individual and the State. Governmental obligations with regard to human rights can broadly be categorized in terms of obligations to respect, protect, and fulfil.

Respect. The obligation to respect requires that States Parties (governments ratifying a treaty) refrain from interfering directly or indirectly with the enjoyment of the right to water.

Protect. The obligation to protect requires that States Parties prevent third parties such as corporations from interfering in any way with the enjoyment of the right to water.

Fulfil. The obligation to fulfil requires that States Parties adopt the necessary measures to achieve the full realization of the right to water.

“Water is fundamental for life and health. The human right to water is indispensable for leading a healthy life in human dignity. It is a pre-requisite to the realization of all other human rights.” General Comment Nr. 15 of the UN Committee on Economic, Social and Cultural Rights, adopted November 27, 2002.

**Integrated Risk and
Disaster Reduction**

Integrated risk and disaster reduction, in addition to post disaster relief, primarily involves prevention of natural disasters. Prevention is an important component in both development cooperation and humanitarian aid. It is a long-term activity that demands coordinated cooperation among various actors. Disaster reduction includes all temporary and permanent measures that aim to prevent the threat of damage or minimize the impacts of a damaging event. It is based on risk assessment, evaluating the potential for damage, and measuring existing risk perception and coping mechanisms (including legislation). In a context where sustainable development is the overall aim, disaster reduction is a continuous process in which measures concerned with prevention, intervention, and reconstruction are equally integrated.

**Integrated Water
Resource Manage-
ment (IWRM)**

IWRM is a process that promotes the coordinated development and management of water, land and related resources in order to maximise economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.

The IWRM approach involves: an integrated, trans-sectoral approach to water, the sustainable management of water resources which ensures that water resources are available for future generations; recognition that water is a valuable resource, with its value reflected in how it is used; and a participatory approach to water resources management involving stakeholders, to ensure equity as well as efficiency in water use.

Irrigation

The application of water to land for agriculture or landscaping purposes, through human-made systems, to provide for plant water requirements not met by precipitation. There are three broad classes of irrigation systems: (1) gravity flow distribution; (2) pressurized distribution; and (3) drainage control systems.

Gravity flow systems convey and distribute water at the field level by a free surface, overland flow regime.

Pressurized systems include sprinkler, trickle, and an array of similar systems in which water is conveyed to and distributed over the farmland through pressurized pipe networks.

Drainage control systems (subirrigation) are not common but are conceptually interesting. Relatively large volumes of water percolate through the root zone and become drainage or groundwater flow. By controlling the flow at critical points, it is possible to raise the level of the groundwater to within reach of crop roots.

These individual irrigation systems have a variety of advantages and particular applications. Familiarity with each system is important in order to best satisfy the needs of irrigation projects during project formulation.

Low-cost irrigation are systems (traditional or modern) that have relative low labour and capital costs. Examples include simple drip-irrigation kits, treadle pumps, certain rope and washer pumps and other technologies currently under development.

**Irrigation,
large-scale**

Large-scale irrigation should be defined not only in terms of size but also by its organisational structure. Characteristics of large-scale irrigation systems are: (1) formal hierarchies of open channels or pipes for delivery of irrigation water and removal of drainage water, (2) formal organisational structures with a legally constituted management institution and (3) central control of operation and management and water allocation and delivery. All formal large-scale irrigation systems comprise four functional components: (1) water source and water capture, (2) water delivery, (3) water use and (4) water disposal.

Users of large-scale irrigation systems may be smallholders, as is the case in Egypt and Sudan, where irrigation schemes are large and managed by the government. Some authors consider these schemes as small-scale rather than large-scale because of the small size of the individual holdings.

**Irrigation,
small-scale, Micro-
Irrigation**

Small-scale irrigation applies water to only a fraction of the soil surface, with water delivered to the plant through a network of pipes via drippers, micro sprinklers or bubblers (controlled orifice) outlets. This is often also referred to as micro-irrigation. These techniques contribute to food security and poverty alleviation by improving the water efficiency of irrigation (more crops and jobs per drop) in water-scarce regions, where rain is insufficient. This enables farmers to sustain and even improve the productivity of irrigated agriculture through the mobilization of their own local resources.

Livelihood Approach

The sustainable livelihood approach is an integrated analytical approach to poverty, used in development projects, research and policy-making. Its primary focus is on the needs and the opportunities of the poor as seen by the poor themselves. The starting point for analysis is survival strategies characterised by their diversity, complexity, unpredictability, and dynamics.

The aim of the sustainable livelihood approach is to shape measures and policies in a joint process of learning and reflection, including different groups of actors, in order to assist poor people in using their own strengths and potentials while also broadening their options and reducing their exposure to adverse external impacts. Empowerment of the poor is thus a central component of this approach.

A further aim is to minimise both the external and internal negative influences of policies, institutions, etc., that threaten the sustainability of poor people's livelihoods.

More Crops and Jobs per Drop

The "more crops and jobs per drop" strategy is in line with the objectives of the World Water Vision presented at the Second World Water Forum in The Hague, March 2000. It is also one of the primary objectives of integrated water resource management. It implies greater food production per unit of water applied, and thus more sustainable livelihoods for women and men through ensured access for all to the food required for healthy and productive lives.

Maximising water productivity means not only maximising agricultural production per drop of water but also maximising the number of rural jobs that can be created with limited water resources. The value of water, in other words, is both the food it can produce and the income it can create.

For SDC the "More Crops and Jobs per Drop" concept is only acceptable if it takes into account environmental and social aspects, both of which are prerequisites to achieve sustainability.

Payments for Environmental Services (PES)

Environmental services are generated by natural assets (sun, soil, water, plants, other living organisms and the atmosphere) and their interaction, providing humankind with economic, ecological and socio-cultural benefits. They include:

Provisioning services: The products obtained from ecosystems, including, for example, genetic resources, food and fibre, and fresh water.

Regulating services: The benefits obtained from the regulation of ecosystem processes, including, for example, the regulation of climate, water, and some human diseases.

Cultural services: The non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experience, including, e.g., knowledge systems, social relations, and aesthetic values.

Supporting service: Ecosystem services that are necessary for the production of all other ecosystem services. Some examples include biomass production, production of atmospheric oxygen, soil formation and retention, nutrient cycling, water cycling, and provisioning of habitat.

These benefits are usually not priced. The hydrological services provided by forests, such as clean and regulated water flow, and reduced sedimentation, for example, are only noticed when natural disasters, flooding, siltation of reservoirs and scarcity of water, occurring as a result of unsustainable land-use exert considerable costs on the user.

Land owners/managers typically receive no compensation/payment for such services and consequently do not consider them in making land-use decisions.

Payment schemes for environmental services (PES) are flexible and direct compensation mechanisms by which service providers are paid by service users. PES schemes in watersheds usually involve the implementation of market mechanisms to compensate upstream landowners in order to maintain or modify a particular land use, which is affecting the availability and/or quality of the downstream water resources.

Polluter Pays Principle

The Polluter Pays Principle is based on an economic approach to pollution control, designed to ensure that the polluter bears the cost of pollution damage and/or the costs incurred in controlling pollution – otherwise known as abatement costs.

The OECD describes it as “the principle to be used for allocating costs of pollution prevention and control measures to encourage rational use of scarce environmental resources and to avoid distortions in international trade and investment”.

Poverty

Poverty is multifaceted and cannot be restricted to a lack of income alone (the poverty line in developing countries is generally defined as an income of one U.S. dollar per day per capita) or to inadequate food consumption (e.g. a minimal calorie intake). Poverty has a qualitative as much as a quantitative aspect. Generally speaking, poverty means privation and lack of well-being. Poverty cannot only be defined from the outside, the poor themselves must also be involved, i.e. understanding poverty requires both intimate and external knowledge. Only if all dimensions and perceptions of poverty are considered, will the individual, social and primarily cultural diversity of human lives also be recognized.

Pro-Poor

Focusing activities on the low-income segments of society, which often have inadequate access to water and other resources or services. “Pro-poor” implies that the overall aim is beneficial towards the poor, while “poverty focused” implies a greater degree of targeting.

Precautionary Principle

The precautionary principle provides guidance for governance and management systems in response to uncertainty. The most widely accepted and cited version of the precautionary principle in the environmental context is Principle 15 of the Rio Declaration, which states:

“In order to protect the environment the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation”.

In general terms, the precautionary approach involves a shift of emphasis in governance of environmental risk, from reacting to clearly defined problems as they arise, to recognising uncertainty and ignorance, anticipating harm, preventing problems, taking cautious action, and monitoring potential impacts.

Private Sector Participation (PSP)

see also *Public-Private Partnerships (PPP)*

The participation of the private sector in delivery of water supplies, irrigation and wastewater services has attracted much attention as a solution to systemic problems of service delivery.

The basis for advocating PSP is the recognition that private commercial companies tend to operate services with greater efficiency and less waste than government-run utilities, while managing to recover their costs. The level of development and the suitability of private sector institutions in different settings will strongly influence the form of participation.

Options are wide-ranging, from minimum private sector involvement, which could consist of contracting out the management of certain major installations; to full divestiture of responsibility for capital investment, operations, and commercial risk to autonomous water companies.

However, introducing marketplace economics into public health engineering has implications which have provoked considerable controversy, especially after a long period in which provision of water and sanitation infrastructure has been primarily regarded throughout the world as a public service to be provided from the public purse, or at least heavily subsidised.

The key issue is how to set up institutional arrangements that allow the commercial sector freedom to introduce marketplace efficiencies while guaranteeing access to services to those communities – by definition the poorest and least able to exercise influence politically or in the marketplace – who are already underserved and most at risk from public health hazards.

In private sector participation processes, the state remains the owner of water resources. It can delegate the distribution and sanitation management of water to private companies, but must retain the responsibility of guaranteeing social equity among the services provided.

Privatisation

A process in which the government transfers state-owned industries (e.g. water, electricity) to the private sector. This usually involves an offer for sale of shares in an industry to the general public.

Public Goods

see also Common Good and Global Public Goods

In common usage, “public good” is often incorrectly associated with “common good,” or with such value-based goals as social equity, social justice and environmental sustainability. Its definition in economic theory is narrower, more precise, and contrasted specifically to “private good.” A private good is one whose individual consumption is both excludable (my use of the good is not dependent on others use) and rivalrous (my use of the good could preclude use by another). This characterizes most market-based commercial/commodity exchanges.

A public good is one that is non-excludable (all people have unimpeded access to it and can profit from it) and – in its pure form – non-rivalrous (the individual consumption of the good does not restrict that by another individual).

Strictly speaking common pool resources such as water do not qualify as public goods since their use is not non-rivalrous and use by one person does affect the use by others.

Public-Private Partnerships (PPP)

see also Private-Sector Participation (PSP)

An agreement between the public sector and a private sector entity, whereby both parties share risks, responsibilities, and in some cases investments.

Inviting the participation of the private sector has recently been recognised as a means of making water supply and sanitation services more efficient and cost-effective, while raising revenue to improve long-term sustainability and generate investment for new infrastructure. Privatisation of public water companies can release public funds for other development activities and reduce administrative burdens. Developing countries can also benefit from the know-how of commercial companies specialised in public services management. The involvement of the commercial private sector can help to underline the value of the natural resource and – given appropriate incentives – can also encourage measures to protect and conserve freshwater supplies.

- A balanced partnership between public authorities and the private sector requires that their respective roles be clearly defined within a legal framework. The level of development in the country, including the level of skills and capacities within the commercial sector, and the nature of institutions in water-related sectors, will strongly influence the form of public-private partnerships.
- Public-Public Partnerships (PUP)**
- A public sector company assists in the development of another public sector operation. The use of “twinning” as a mechanism of capacity building provides a prototype for PUPs.
- The public sector has a key role to play in the sustainable development of the world’s water services for all of its citizens – rich and poor. The general notion of public-public partnerships (PUPs) is a form of international cooperation and action whereby existing, experienced public service agencies partner others to help them build capacity, on the basis of mutual, not for profit, support.
- Given the difficult conditions for privatisation in most developing countries, capacity building, know-how transfer and financing through co-operation with state-owned enterprises and with state agencies from other countries is a particularly promising alternative.
- Rainfed Agriculture**
- A farming system in which crop water needs are met by natural precipitation.
- Scarcity**
- An area is experiencing water scarcity when annual water supplies drop below 1,000 m³ per person. Water scarcity is grouped into three categories: physical water scarcity, economic water scarcity, and little or no water scarcity. If the primary water supply (PWS) of a country exceeds 60 percent of its potentially utilizable water resources (PUWR), it faces physical water scarcity. Even with the highest efficiency and productivity, the country will not be able to meet the demands of its domestic, industrial and agricultural sectors, nor satisfy its environmental needs. Water will be diverted from agriculture to other sectors and food will have to be imported, while costly investments will have to be made in desalination plants. Countries facing economic scarcity have sufficient PUWR to meet the additional PWS, but have to increase their PWS through storage and supply systems by more than 25 percent. Most of these countries will face serious problems, both financially and in terms of capacity, in increasing their PWS by these levels. They need to put considerable efforts into improving the efficiency of their water use by applying a policy of sustainable management of water resources.
- Stakeholder**
- Individuals or representatives of a group who have an interest in a particular decision. This includes people who influence a decision, or can influence it, as well as those affected by it.
- Subsidiarity Principle**
- “Responsibilities for water related services and resource management need to be decentralised to the lowest appropriate administrative level according to the concept of subsidiarity.”
- The intent of this principle is to discourage the perpetuation of centralised command structures in authorities responsible for water resource management. Such structures, seen as disciplined and managerially accountable, tend to inhibit participation by stakeholders in decision-making on service delivery. However, the “lowest appropriate administrative level” should not be a level without the resources, clout or technical expertise to take informed and effective decisions.

Subsidiarity must not be allowed to mean abandonment of responsibility; rather it should encourage the mobilisation of resources and inputs at all levels, as well as capacity building to allow greater decentralisation of decision making on a progressive basis.

Transboundary Waters

The waters of a number of major rivers are shared between two or more countries in the developing world. There are 261 watersheds which cross the political boundaries of two or more countries. These international basins cover 45 percent of the earth's land surface, affect about 40 percent of the world's population, and account for approximately 60 percent of global river flow. In some cases, the geographical basin includes not only more than one single national territory, but several autonomous states within one of the countries. Generalized legal principles for the management of transboundary waters are currently defined by the Convention on the Non-Navigational Uses of International Watercourses, ratified by the UN General Assembly in 1997. Although the idea of the international river basin organisations (RBOs) enjoys the support of international organisations, particularly UN bodies, it has so far met with only modest success. This is not surprising, since a high degree of common purpose is required to reach agreement over the sharing of the waters of large international rivers. However, since this is a potential cause of conflict, notably in the Middle East, efforts to bring the various countries and states together to plan water resources development on a mutually agreed basis clearly need to be emphasised. The International Network of Basin Organisations (INBO) exists to promote such mechanisms, which could become a catalyst for inter-state co-operation.

Virtual Water

The concept of Virtual Water was coined to replace the term "embedded water", which had little impact.

Virtual water is the amount of water required for the production of food or other products. This amount can range from 10 000 litres per kg for beef, to 800 litres per kg for milk.

Trade in virtual water allows countries with water scarcity to import products that consume high levels of water and export products that consume low levels, thus making water available for other purposes.

Including virtual water as a policy option requires a thorough understanding of the impact of virtual water trade on the local, social, environmental, economic and cultural situation. Local, national and regional food security should be enhanced by appropriate agreements in agricultural products trade, while respecting a nation's right to food sovereignty.

Wastewater

(1) A combination of liquid and water-carried pollutants from homes, businesses, industries or farms; a mixture of water and dissolved or suspended solids.

(2) Water for which, because of quality, quantity or time of availability, disposal is more economical than use at the time and point of its occurrence. Waste water to one user may be a desirable supply to the same or another user at a different location. Also referred to as Domestic Wastewater.

Water-Borne Diseases

The term water-borne disease is often used loosely, to describe all diseases carried and transmitted by water. Strictly speaking, water-borne diseases are those in which the infectious agent is itself carried by water: diarrhoeal diseases including typhoid, cholera and dysentery; and infectious hepatitis. Other diseases are water-washed: skin diseases and eye diseases; or water-related,

in which case the disease is spread via an organism living in water, such as schistosomiasis (via snails) and guinea-worm. These may be insect related, in which case they are spread by an insect that breeds in water or inflicts bites near it, as in the case of sleeping sickness (tsetse fly), malaria and yellow fever (mosquito), or river blindness (black fly).

Other diseases are spread by poor sanitation; pathogens in human excreta remain exposed or are washed into waterways. These include all diarrhoeal diseases and parasites such as hookworm and roundworm. Lack of hygiene plays an enormous role in the incidence of these diseases, with the exception of water-related diseases.

Water Conflict

Water resources have rarely, if ever, been the sole source of violent conflict or war. But this fact has led some international security „experts“ to ignore or belittle the complex and real relationships between water and security. Conflicts currently arise in relation to the following:

Control of water resources (state and non-state actors): in this case, water supplies or access to water are at the root of tensions.

Use as a military tool (state actors): water resources, or water systems themselves, are used by a nation or state as a weapon during a military action.

Use as a political tool (state and non-state actors): water resources, or water systems themselves, are used by a nation, state or non-state actor for a political goal.

Terrorism (non-state actors): water resources, or water systems, are either targets or tools of violence or coercion by non-state actors.

Military target (state actors): water resource systems are targets of military actions by nations or states.

Development disputes (state and non-state actors): *water resources* or water systems are a major source of contention and dispute in the context of economic and social development.

Water Course

see also *Transboundary Waters*

A system of surface waters and ground waters, constituting a unitary whole by virtue of their physical relationship, and normally flowing into a common end point.

Water Cycle

The paths water takes through its various states – vapour, liquid, solid – as it moves through oceans, the atmosphere, as groundwater and in streams, by means of precipitation, infiltration, evapotranspiration and condensation, constitute the water cycle.

Water Governance

Water governance refers to the range of political, organisational and administrative processes through which communities articulate their interests, their inputs are absorbed, decisions are made and implemented and decision makers are held accountable in the development and management of water resources and delivery of water services.

Water Ownership

It is important to distinguish between ownership of water, and the right to have access to water and use it. Regulation of the resource can only arise out of the recognition, explicit or implicit, that the government has the right to manage the resource for the public good. Most governments expressly own water, and the protection of the resource is therefore a public function to which individual rights are subservient.

The right to use water is based either on customary or statutory claims. In order to be regulated, these must be clearly identified. Customary rights may include the right to expropriate, use or trade water; based on these can be built systems of community ownership or use and water charges. While building upon existing systems is often the surest and most acceptable route to implementation, systems based only on customary rights may not be able to assure efficient and equitable allocation of a scarce resource.

A system of water law needs not only mechanisms of ensuring access to water (water rights) but also a system of obligations regarding usage and control of the levying of water charges by individuals (restriction of rights).

Water Resources

Distinction is made between renewable and non-renewable water resources. Non-renewable water resources, including so-called fossil waters, are not replenished at all by nature, or require a very long time for replenishment. Renewable water resources comprise groundwater aquifers and surface water such as rivers and lakes. They are recharged through the hydrological cycle, but can be overexploited.

Freshwater resources can be subdivided into blue and green water. **Blue water** refers to the water flows in groundwater and surface water (river, lakes). It represents the water that can be withdrawn e.g. for irrigation or is available for *in-situ* water use like navigation. In areas without enough green water in the soil to achieve satisfactory crop growth, crops can be irrigated with blue water.

Green water is defined as the fraction of water that is evapotranspired, i.e. the water supply for all non-irrigated vegetation. Green water can be called either productive with respect to plant production (if transpired by crops or natural vegetation) or non-productive (if evaporated from soil, open water or interception in the canopies of trees and plants).

Water Transfer

Water transfer is the act or process whereby water is brought into an area or region which would not naturally receive it. Typically, it refers to the artificial transport of water through aqueducts, canals, or pipelines from one water basin, drainage area, or hydrographic area to another, which affects natural surface and groundwater drainage and flow patterns in both the water exporting and importing areas.

In terms of a Water Banking or Water Marketing concept, actions to move water from areas of low use to areas of high use place a more realistic monetary value on water as a scarce economic commodity and result in enhanced economic efficiency. However, considerable public concern and controversy surround this practice. Concerns focus primarily on issues relating to altering the natural flows of surface and ground waters, adverse environmental and habitat impacts on water exporting areas, limitations placed on the long-term growth and development of the water exporting region or hydrographic area, the potentially adverse hydrologic effects on groundwater (water table and aquifer) conditions in the exporting area, and the dependency of water-importing areas on continued diversions and water importations.

Water Users Association

Water Users Associations normally comprise a formal, usually legally bound group of water users, often located around a particular canal or borehole, with responsibility for managing and maintaining the part of the system that serves them. These Associations exist as a result of government determination, often with donor support, to devolve some of the responsibility for the management and maintenance of irrigation or domestic water and wastewater services from central governments onto users. Motivated by the search for efficiency and cost savings, Water Users Associations can be seen as a form of privatisation, with the government agency adopting the role of service provider rather than operator.

Water Users Associations are also a means of community participation and community ownership of management and operation. In principle, their creation should lead to greater user commitment and reduced government intervention.

Water Use Categories

Water use categories are defined in relation to IWRM by the Global Water Partnership (GWP).

Water for People refers to the drinking water sector and to sanitation services;

Water for Food refers to the farming sector including livestock and fisheries and rainfed or irrigated cultivation of food, feed or fibre crops;

Water for Nature refers to the source of water as well as to the availability of water for nature and for the preservation of ecosystems (wetlands, coastal, marine and terrestrial ecosystems);

Water for Other Uses refers mainly to the use of water for industry, energy and transportation.

IWRM considers the water use of all the different categories together as well as the effects of each category on the others.

Water User Rights

The following types of rights can be identified in an analytical sense (the summary is not exhaustive):

Absolute water ownership right. Water belongs to the property on which it is found and is part of the real estate. The owner of the property also owns the water. He may use it for any purpose whatsoever (*ius utendi et abutendi*).

Absolute user right. Water is owned by somebody else or another institution, often by the state as part of the public domain. The right to use, however, in its purest sense is absolute. It is not attached to land or dependent on a specific extraction point; it can be leased, sold, inherited or mortgaged, and is not restricted to any type of effective and beneficial use. The owner can hold it as an object of speculation. Only very few legal systems, e.g. in the Western United States and in Chile, have a water right concept close to these absolute user rights.

A relative user right may have some of the restrictions mentioned above. Often, it is attached to land and specific extraction points; it cannot be sold or transferred, mortgaged or inherited. It is restricted to a certain type of beneficial and effective use: agriculture, cattle watering, drinking water supply. Non-use can constitute loss of use rights, either temporary or indefinite. This is a very common type of right and found all over the world.

A water permit (concession, licence) is acquired through administrative allocation or authorisation. It may have time limitations on use and it may be subjected to charges or fees, either for use or as a contribution to the water management services.

The legal status of a right can have far-reaching consequences in terms of ability to trade, transfer or inherit a right, or to use it for collateral or as a secure investment. It is more difficult to attach conditions (time, charges, suspension) to ownership and absolute user rights than to relative user rights, permits and concessions. More often than not, the Constitution of a nation protects ownership rights and absolute rights to the extent that compensation is required in case of expropriation. A water right may be expressed in volumetric terms (m^3/s or l/s), as a share of the stream or canal flow, or as a share of the water available in a reservoir, a lake or an aquifer. A water right may also be expressed in terms of shifts or hours of water availability from a certain intake. It is also possible to express a water right as a percentage of storage capacity. A water right may be applied by simple diversion, or by extraction through mobile or fixed pumping installations.

Watershed

The definitions of watershed, catchment area or drainage basin vary considerably. The terms are often used synonymously and refer to the various sizes of areas in which water is drained towards a specific point or area. The European Environment Agency, for example, defines the three terms as follows:

Catchment area: an area from which surface runoff is carried away by a single drainage system-; the area of land bounded by watersheds draining into a river, basin or reservoir.

Drainage basin: the area of land that drains water, sediment and dissolved materials to a common outlet at some point along a stream channel.

Watershed: the land area that drains water to a particular stream, river or lake. It is a land feature that can be identified by tracing a line along the highest elevations between two areas on a map, often a ridge. The watershed for a major river may encompass a number of smaller watersheds (micro-watersheds) that ultimately combine at a common point.

Watershed Management

Watershed Management is an iterative process of integrated decision-making regarding uses and modifications of lands and waters within a watershed. This process provides a chance for stakeholders to balance diverse goals and uses for environmental resources, and to consider how their cumulative actions may affect long-term sustainability of these resources. Watershed management requires use of the social, ecological and economic sciences. Common goals for land and water resources must be developed among people of diverse social backgrounds and values.

Of principle concern is management of the basin's water budget, that is the routing of precipitation through pathways of evaporation, infiltration, and overland flow. As a form of ecosystem management, watershed management encompasses the entire watershed system from uplands and headwaters, to floodplain wetlands and river channels.

Wetland

In general a wetland is a low-lying area such as a marsh or swamp, that is saturated with moisture.

Ramsar gives another definition of wetlands: "Areas of marsh, fen, peat land or water, whether natural or artificial, permanent or temporary, with water that is static, flowing, fresh, brackish or salty, including areas of marine water, the depth of which at low tide does not exceed six meters".

Under normal circumstances, wetlands support a prevalence of vegetation, typically adapted for life in saturated soil conditions.

ANNEX 1

Significance of the Water Sector in Attaining the Millennium Development Goals

MDGs and relevant Targets	Contributions of domestic water supply and sanitation	Contributions of sound water resources management and development
<p>Poverty To halve the proportion of the world's people whose income is less than \$1/day</p>	<ul style="list-style-type: none"> Household livelihood security rests on the health of its members; adults who are ill themselves or who must care for sick children are less productive. Illnesses caused by unsafe <i>drinking water</i> and inadequate sanitation generate health costs that can claim a large share of poor households' income. Time spent collecting water cannot be used for other livelihood activities. 	<ul style="list-style-type: none"> Water is a factor of production in agriculture, industry and other economic activities that provide livelihoods for poor people. Investments in water infrastructure can be a catalyst for local/regional development. Reduced ecosystem degradation and reduced vulnerability to water-related disasters make livelihood systems of the poor more secure.
<p>Hunger To halve the proportion of the world's people who suffer from hunger</p>	<ul style="list-style-type: none"> Healthy people are better able to absorb the nutrients in food than those suffering from water and sanitation related diseases, particularly worms, which rob their hosts of calories. 	<ul style="list-style-type: none"> Water is a direct input to irrigation for expanded food crop production. Reliable water is necessary for subsistence agriculture, home gardens, livestock, tree crops. Fish, nuts, and other foods gathered from common property resources depend on the quality and quantity of water in ecosystems. Cheaper food prices reduce urban hunger.
<p>Primary Education To ensure that children everywhere complete primary schooling</p>	<ul style="list-style-type: none"> Improved WSS services relieve girls from water collection duties, allowing them to attend school. Reduced WSS-related illness improve school attendance, especially for girls. Having separate sanitation facilities for girls in schools increases their school attendance, especially after menarche. 	<ul style="list-style-type: none"> Improved water management reduces the incidence of catastrophic events like floods that interrupt educational attainment.

MDGs and relevant Targets	Contributions of domestic water supply and sanitation	Contributions of sound water resources management and development
<p>Gender Equality To ensure that girls and boys have equal access to primary and secondary education</p>	<ul style="list-style-type: none"> • Reduced time, health, and care-giving burdens from improved water services give women more time for productive endeavors, adult education, empowerment activities, leisure. • Water and sanitation facilities closer to home put women and girls at less risk of sexual harassment/assault while gathering water and searching for privacy. • Higher rates of child survival are a precursor to the demographic transition to lower fertility rates; having fewer children reduces women's household responsibilities and increases their opportunities for personal development. 	<ul style="list-style-type: none"> • Community-based organizations for water management can improve social capital of women by giving them leadership and networking opportunities and building solidarity among them.
<p>Child Mortality To reduce by two-thirds the death rate for children under five</p>	<ul style="list-style-type: none"> • Improved sanitation, safe <i>drinking water</i> sources and greater quantities of domestic water for washing, reduce infant and child morbidity and mortality. • Sanitation and safe water in health-care facilities help ensure clean delivery and reduce neonatal deaths. • Mothers with improved WSS services are better able to care for their children, both because they have fewer illnesses and because they devote less time to water collection and seeking privacy for defecation and urination. 	<ul style="list-style-type: none"> • Improved nutrition and food security reduces susceptibility to diseases. • Equitably managed <i>water resources</i> help poor people make a decent living and reduce their vulnerability to shocks, which in turn gives them more secure and fruitful livelihoods to draw upon in caring for their children. • Malaria is a leading cause of death among children, and appropriate water management reduces mosquito habitats.

MDGs and relevant Targets	Contributions of domestic water supply and sanitation	Contributions of sound water resources management and development
<p>Maternal Mortality To reduce by threefourths the rate of maternal mortality</p>	<ul style="list-style-type: none"> • Accessible sources of water reduce labour burdens and health problems resulting from water portage, reducing maternal mortality risks. • Improved health and nutrition reduce susceptibility to anaemia and other conditions that affect maternal mortality. • Safe <i>drinking water</i> and basic sanitation are needed in health-care facilities to ensure basic hygiene practices following delivery. • Higher rates of child survival are a precursor to the demographic transition toward lower fertility rates, and fewer pregnancies per woman reduce maternal mortality. 	<ul style="list-style-type: none"> • Improved nutrition and food security reduces susceptibility to diseases that can complicate pregnancy. • Malaria is particularly dangerous to pregnant women, and appropriate water management reduces mosquito habitats.
<p>Major Disease To halt and begin to reverse the spread of HIV, malaria, other major diseases</p>	<ul style="list-style-type: none"> • Safe <i>drinking water</i> and basic sanitation help prevent water-related diseases, including diarrheal diseases, schistosomiasis, filariasis, trachoma, and helminthes. 1.6 million deaths per year are attributed to unsafe water, poor sanitation, and lack of hygiene. • Improved water supply reduces diarrhea morbidity by 21%; improved sanitation reduces diarrhea morbidity by 37,5%; handwashing can reduce the number of diarrheal cases by up to 35%; additional improvements in <i>drinking water</i> quality, such as point-of-use disinfection, would reduce diarrheal incidence by 45%. 	<ul style="list-style-type: none"> • Improved water (and <i>wastewater</i>) management in human settlements reduces transmission risks of mosquito-borne illness like malaria and dengue fever. 1.2 million people die of malaria each year, 90% of whom are children under 5. • Improved health and nutrition reduce susceptibility to/severity of HIV/AIDS and other major diseases.

MDGs and relevant Targets	Contributions of domestic water supply and sanitation	Contributions of sound water resources management and development
Environmental Sustainability To stop the unsustainable exploitation of natural resources	<ul style="list-style-type: none"> • Adequate treatment and disposal of excreta and wastewater contribute to less pressure on <i>freshwater resources</i>. • Improved sanitation reduces flows of human excreta into waterways, helping to protect human and environmental health. 	<ul style="list-style-type: none"> • Improved water management, including pollution control and water conservation, is a key factor in maintaining ecosystems integrity. • Integrated management within river basins allows for approaches that preserve ecosystem health.
Slum Dwellers To improve the lives of 100 million slum dwellers	<ul style="list-style-type: none"> • Inadequate access to safe water, sanitation and other infrastructure are main defining characteristics of a slum. 	<ul style="list-style-type: none"> • Slum settlements are often built on sites particularly vulnerable to water-related disasters.

Source: Millennium Project Task Force 7 on Water and Sanitation: "Investing in the Future: Water's Role in Achieving the Millennium Development Goals" (Abridged Final Report).

ANNEX 2

30 Years of SDC Experiences in the Water Sector

Detailed documentation of SDC's experiences in the water sector can be found in the publication "Water and Development" 2003.

Drinking Water and Sanitation

- Affordable and sustainable access to safe water and sanitation for the poor represents one of the keys to tackle the interlinked problems of poverty, ill-health and environmental degradation.
- Rural communities can manage and pay for water and sanitation infrastructure if offered a real choice of technology/service delivery, and if given a voice in infrastructure design and service delivery methods.
- Well functioning utilities are essential for the urban poor to gain persistent access to water supply and sanitation services.
- Serving the poor also requires strategic interventions covering payment terms, alternative service provision, flexible service conditions, differential tariffs and targeted subsidies.
- The lack of access to basic sanitation is an increasing problem in the developing world, but the lack of political commitment often leads to low investment and poor performance.
- The vicious circle of inadequate resources, failures and frustration may be overcome with *Private Public Partnerships* (PPP, where the local, national and international private sectors are major players) to supply water and sanitation services and equipment to the households.
- The integration of productive uses of water and waste into *drinking water* and sanitation projects (such as small-scale horticulture, animal husbandry and handicrafts) contributes to the sustainability and positive impact of the services provided – increasing the quality of nutrition and health for families as well as their revenues.

Rainfed and Irrigated Farming

- There is a high potential to improve *rainfed farming* by water harvesting and improved soil and water management practises, particularly in sloping areas, judicious groundwater use for small scale supplemental *irrigation* and drought tolerant crops.
- Centrally managed, large scale *irrigation* schemes have a bad record and do not address and respond to the needs of the water users adequately.
- The establishment and the strengthening of *Water Users Associations* and decentralised management by the users can improve water use efficiency and productivity.

- Low-cost technologies for water harvesting, storage and *micro-irrigation* can be cost-effective alternatives to large infrastructure projects with their complex management problems.
- In various countries, the promotion of the treadle pump is a success – private-sector supply chains have produced and sold over 1.3 million units in Bangladesh and countries like Mali, Benin and Niger follow.
- Access to information, weather forecasts and advice on *farming* practises is crucial for the development of sustainable *farming* systems.

Watershed and River Basin Management

- The *watershed* provides a coherent framework to tackle the complexity and competitive interests regarding water resource uses.
- River commissions are efficient platforms for multi *stakeholder* dialogue at the regional level.
- *Water Users Associations* at the village level are needed to reinforce the voice of the poor in these commissions and to ensure equity between different user groups.
- River basin management is a powerful instrument for conflict resolution between competing groups or neighbouring states.

Institutional Setup and Governance

- In many developing countries, the participation of the *private sector* (in particular national and local private sector) in partnership with the public sector has the potential to increase investment, performance and efficiency in the water sector.
- PPPs are able to serve the poor and to generate much needed investments, but they need an enabling environment, clear regulations and – particularly in rural areas – initial support from the public sector and/or specialised NGOs and/or donors.
- Viable *private sector* supply chains for goods and services are essential for the long-term sustainability of water systems.
- To assure the sustainability of their water services, rural populations have the willingness and capability to well manage their system and, protect their *watersheds* well, and to contribute to the conservation of ecosystems.
- Capacity building at all levels is essential, but it must be balanced with investments in physical infrastructure.
- Reforming the water and sanitation sector is a powerful way of supporting the municipal development and decentralisation processes.
- Changes in water management have to be supported through legal and policy measures.



